

COMPLEX OF STRUCTURAL ELEMENTS FOR FORMING GLASS BRICK WALLS

The present invention relates to a complex of structural elements for forming glass brick walls.

PVC frames for glass brick walls are known consisting of a perimetral structure supporting a plurality of horizontal stringers connected together vertically by upright pieces which engage therein by snap-fitting or insertion, to form a lattice which embraces the four edges of each glass brick inserted into it and provides formworks in which cement mix is cast.

These known frames present however certain drawbacks and in particular:

- an unpleasant outer appearance due to the presence of the PVC stringers and upright pierces which remain visible covering the spacings,
- the impossibility of modifying or relocating the structure once assembled and the cement has been added,
- limited use because of its weight.

An object of the invention is to eliminate these drawbacks by providing a complex of structural elements for forming glass brick walls which, besides solving the appearance problem, presents reliable immobility characteristics even in walls of large dimensions.

Another object of the invention is to provide a complex of structural elements which can be demounted and remounted if required.

These and other objects which will be apparent from the ensuing description are attained according to the invention by a complex of structural elements for forming glass brick walls as described in claim 1.

A preferred embodiment of the present invention together with some modifications thereto are described in detail hereinafter by way of non-limiting example with reference to the accompanying drawings, in which:

- Figure 1 is an exploded interrupted perspective view of a complex of structural elements according to the invention assembled with glass bricks, particularly for interiors,
- Figure 2 is a perspective view of the perimetral profile bar,
- Figure 3 is a perspective view of an aluminium profile bar forming the horizontal stringer,
- Figure 4 is a perspective view of a vertical connecting divider,
- Figure 5 shows in the same view as Figure 1 a complex of elements in the form using dividers with a plastic core,
- Figure 6 shows the intermediate divider,
- Figure 7 shows the end divider,
- Figure 8 is a front view of the system for connecting the stringers to the vertical profile bars, with the top free and the bottom locked,
- Figure 9 is a perspective view showing an expansion joint for large-width walls (greater than 6 metres),
- Figure 10 is a perspective view showing an accessory for fixing and bracing against the thrust of the wind,
- Figure 11 shows the complex in the same view as Figure 1, in the form for constructing outside walls, and
- Figure 12 shows the aluminium profile bar forming the stringers and dividers of this complex.

As can be seen from the figures, the complex of structural elements according to the invention comprises substantially a perimetral C-shaped aluminium profile bar 2, a plurality of intermediate horizontal stringers 4 formed from aluminium profile bars and a plurality of vertical dividers 6 also of aluminium.

The perimetral profile bar 2 is provided, on each inner surface of the side walls 8, with two pairs of ribs 10, each rib comprising on that surface facing the other rib an engagement tooth 12.

The horizontal stringer comprises a central web 14 which is provided at its ends with cylindrical portions 16 and from which two substantially T-shaped flanges 18 extend. The central web is provided at regular intervals with through holes 20.

The divider 6 is substantially equal in form to the horizontal stringer but without the holes 20.

The complex also comprises a coupling element 22 consisting of a substantially rectangular element consisting of a substantially rectangular element which has its minor sides 24 faceted and comprises two slotted holes 26 of curved extension. The sides 24 consist of a flat portion 28 and a curved portion 30, the distance between the flat portions being substantially equal to the distance between the facing cavities formed by the ribs 10 of the profile bar 2.

To form a glass brick wall, the complex of structural elements of the invention is assembled in the following manner.

Firstly the retaining half-frame is formed by resting a C-shaped perimetral profile bar 2 on the ground and preferably fixing it with screws or pins, then placing C-shaped perimetral elements 2 vertically against the sides thereof. If lateral retaining walls for the frame are available, the two perimetral profile bars are fixed

to these by screws or pins, alternatively if these walls are not available the vertical profile bars are fixed to the floor and ceiling.

The first row of glass bricks 32 is rested on the upper ribs 10 of the horizontal C-shaped profile bar, with each brick separated from the adjacent brick by interposing a divider 6.

The coupling elements 22 are then applied to the ends of the horizontal stringer 4 by screws which pass through the slotted holes 26, to engage in the cylindrical cavities 16 in the stringers. The stringer 4 is then applied to the vertical C-shaped profile bars 2 while maintaining its web inclined to the horizontal such as to insert the curved edges 30 of the coupling elements 22 between the ribs 10 of the C-shaped profile bar 2.

The stringer 4 is then rotated so that its central web 14 lies horizontally. This configuration is maintained stable by forcibly rotating the element 22 so that its flat portions 28 engage between the ribs 20 of the C-shaped profile bar 2. When the stringer has been applied, pins 34 are inserted through its holes 20 to engage the cylindrical cavities 16 of the underlying dividers 6.

The second row of glass bricks is then applied to the stringer in the aforesaid manner.

When the required height has been reached, a further profile bar 2 is applied with its cavity facing downwards, to form the upper closure element of the frame.

In the embodiment illustrated in Figures 11 and 12, a complex of structural elements mainly for external walls is shown.

In this embodiment the stringers and dividers have only one T-shaped appendix, namely that facing inwards. In this embodiment the stringer also

comprises a longitudinal groove 64 housing a rubber gasket which also performs the function of retaining the glass brick.

In the case of large-dimension walls the invention also uses a bar 36 of substantially rectangular cross-section provided in one of its minor sides with slotted holes 38 terminating with an eyelet 40 through which threaded pins 42 are inserted to axially engage said holes by means of nuts 44, and are locked with their ends in holes provided in the edges of the horizontal stringer 4.

By virtue of the slotted holes 38, the structure can undergo small movements, so making it independent of the main structure of the building.

In the case of large-width walls, for which stringers longer than six metres have to be used, the invention also uses a further H-shaped profile bar 46, the flanges of which embrace two back-to-back C-shaped profile bars 2, and which is also provided with two U appendices 48 which when assembled form a seat 50 for the insertion of a head 52 provided at the end of a pin 54 engagable in the aforescribed profile bar 36. This form of assembly also constitutes an expansion joint for absorbing temperature swings.

In the embodiment shown in Figures from 5 to 7, the divider consists of ladder-shaped plastic spacers provided at their ends with coupling elements 58, which engage in the horizontal perimetral profile bars. The spacers present vertical portions 60 suitably shaped to snap-engage in a continuous aluminium profile bar 62 which hence provides continuity and a pleasant outer appearance.

From the aforestated it is apparent that the complex of structural elements according to the invention presents numerous advantages, and in particular:

- it presents a pleasant outer appearance because of the presence of the aluminium profile bars,

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- it presents reliable immobility characteristics because of the presence of the bracing elements,
- it can be easily and comfortably demounted and remounted because of the elimination of cementitious assembly material.

In a further embodiment not shown in the drawings each divider and/or each stringer are made of wood and are provided at their ends with two seats for the snap engagement of an aluminium T-shaped appendix.